

In the drawings:

A Request for Drawing Change Approval accompanies this Amendment adding the numerals 52, 54 and 56 for the tab, lock member, and punch respectively as requested by the Examiner.

REMARKS

After entry of this Amendment, claims 1-38 and 40-47 are pending in the application. Claims 8 and 38 have been amended. Claim 39 has been cancelled without prejudice. Reconsideration of the application as amended is requested.

In the Office Action dated March 5, 2002, the Examiner indicated that claims 11-17 are withdrawn from further consideration, which is inconsistent with the indication in the Office Action dated October 10, 2001 where the Examiner indicated that claims 11-26 were being withdrawn from further consideration. Clarification of which claims are being withdrawn from further consideration from the Examiner is requested.

The first page of the application has been amended to include the related applications section claiming priority from the earlier parent application from which this is a divisional. The Examiner states that a substitute declaration claiming benefit under 35 U.S.C. §120 to parent patent application serial number 09/187,311, now U.S. Patent No. 6,192,585 is required. It is submitted that 37 C.F.R. 1.63(d), provides that a newly executed oath or declaration is not required in a continuation or divisional application filed by all or by fewer than all of the inventors named in a prior nonprovisional application containing a signed oath or declaration as required by 37 C.F.R. 1.63, provided that a copy of the signed oath or declaration filed in the prior application is submitted for the continuation or divisional application and the specification and drawings filed in the continuation or divisional application do not contain any subject matter that would have been new matter in the prior application. The copy of the oath or declaration must show the signature of the inventor(s) or contain an indication thereon that the oath or declaration was signed. The copy of the prior signed oath was submitted with divisional application as indicated on the transmittal letter, postcard, and cover letter. An additional copy of the signed

declaration is enclosed with this Amendment as a replacement for the one previously filed, if lost by the U.S. Patent Office. Withdrawal of the request for a new declaration is requested, since it is not required pursuant to the MPEP.

The drawings stand objected to for failing to show the lock member as claimed in claims 5-6 and 31, and for failing to show the punch as set forth in claim 8. A Request for Drawing Change Approval accompanies this Amendment showing the tab 52, lock member 54, and punch or diverter 56 in red-line for the Examiner's approval.

Claim 8 stands rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner asserts that claim 8 is unclear as to what a punch structurally constitutes. It is submitted that claim 8 has been amended to replace the phrase "punch in" with the phrase "diverter extending with respect to" the helix passage to direct ball bearings into the cross over passage. Reconsideration of the Examiner's rejection of claim 8 is requested.

Claims 1-9, 18-35, and 37-47 stand rejected under 35 U.S.C. §102(b) as being anticipated by Nilsson (U.S. Patent No. 4,364,282). It is submitted that the Nilsson reference does not anticipate, teach or suggest the invention as recited in the claims of the present application. In particular, the Nilsson reference does not anticipate, teach or suggest at least two eyelets as best seen in Figures 18 and 19 of the present application, where a helix passage is formed in a flange end and a cross-over passage is formed in the flange end. An eyelet is a ring of material having an aperture extending therethrough as clearly illustrated in Figures 18 and 19. The Nilsson reference does not disclose at least two eyelets for forming a nut as set forth in claims 1-10, and 27-37. None of the cited references anticipate, teach or suggest the use of at least two eyelets to form a nut except for the disclosure of the present application. With respect to claims 44-47, these claims specifically recite that a first portion of a cross-over passage is formed in the first stamped part, while a second portion of the cross-over passage is formed in the second stamped part, so that when the two stamped parts are assembled in face-to-face, flange-to-flange relationship, the two portions of the cross-over passage mate with respect to one another to define the

ball nut with a continuous recirculating path. The Nilsson reference does not teach or suggest this structural configuration, since Nilsson teaches forming the complete cross-over passage 18 in one part, while a second complete cross over passage 19 is formed in the other part. With respect to claims 18-26, the Nilsson reference does not anticipate, teach or suggest a flat metal strip rolled to a predetermined diameter in combination with a carrier for receiving the rolled strip inserted therein as best seen in Figures 10-13 of the present application. The Nilsson reference teaches a stamped part, and does not anticipate, teach or suggest a rolled strip as set forth in claims 18-26. With respect to claims 38-43, claim 38 has been amended to include the subject matter previously recited in claim 39. Claim 39 has been cancelled without prejudice. This Amendment to claim 38 specifies that the ball nut body has an elongate, generally cylindrical-shaped, metal injection molded body. The Nilsson reference does not anticipate, teach or suggest a metal injection molded ball nut body. Reconsideration of the Examiner's rejection is requested.

Claims 1-9, 18-35, and 37-47 stand rejected under 35 U.S.C. §102(b) as being anticipated by Galonska (U.S. Patent No. 3,006,212). It is submitted that the Galonska patent reference does not anticipate, teach or suggest the invention as recited in the claims of the present application. In particular, the Galonska reference does not anticipate, teach or suggest at least two eyelets, where a helix passage is partially formed in each flange end and a cross-over passage is partially formed in the flange end of each eyelet as best seen in Figures 18-19 of the present application. An eyelet is defined as a ring of material having an aperture, and the structure disclosed by the Galonska reference does not anticipate, teach or suggest the eyelet structure used to form the ball nut. The present application is the only reference that teaches the use of at least two eyelets to form a ball nut as recited in claims 1-10, and 27-37. With respect to claims 44-47, the Galonska reference does not anticipate, teach or suggest a first stamped part with a first portion of a groove and a first portion of a cross-over passage in the first flange region, and a second stamped part with a second portion of the groove and a second portion of the cross over passage in the second flange region. The only portion formed in the flat flange region of the Galonska reference is the cross over passage 36, which does not meet the structural limitations

as set forth in claims 44-47. With respect to claims 18-26, the Galonska reference does not anticipate, teach or suggest a flat metal strip rolled to a predetermined diameter and lead in combination with a carrier for receiving the rolled strip as best seen in Figures 10-13 of the present application. With respect to claims 38-43, claim 38 has been amended to include the subject matter previously recited in claim 39. Claim 39 has been cancelled without prejudice. As amended, claims 38-43 require the ball nut body to have an elongate generally cylindrical-shaped metal injection mold body. The Galonska reference does not anticipate, teach or suggest a metal injection molded ball nut body as now recited in these claims. Reconsideration of the Examiner's rejection is requested.

With respect to claims 10 and 36, the Examiner's reliance on Nilsson and/or Galonska references is insufficient to provide a *prima facie* obviousness type rejection. None of the references anticipate, teach or suggest an eyelet hardened to R<sub>c</sub> 62 hardness as specified in these claims. In addition, these references do not overcome the deficiencies set forth in greater detail above, specifically that the references do not teach or suggest at least two eyelets forming the ball nut, where each eyelet is a ring of material having an aperture therethrough. This specific structural configuration as best seen in Figures 18 and 19 and is not anticipated, taught or suggested by the references cited by the Examiner. Reconsideration of the Examiner's rejection is requested.

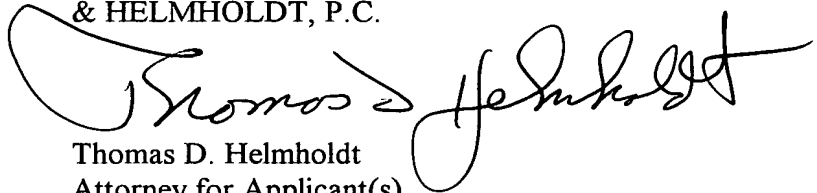
It is respectfully submitted that this Amendment traverses and overcomes all of the Examiner's objections and rejections to the application as originally filed. It is further submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. Reconsideration of the application as amended is requested. It is respectfully submitted that this Amendment places the application in suitable condition for allowance; notice of which is requested.

If the Examiner feels that prosecution of the present application can be

expedited by way of an Examiner's amendment, the Examiner is invited to contact the Applicant's attorney at the telephone number listed below.

Respectfully submitted,

YOUNG, BASILE, HANLON, MacFARLANE, WOOD  
& HELMHOLDT, P.C.

A handwritten signature in black ink, appearing to read "Thomas D. Helmholdt", is written over the printed name and firm name.

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Dated: June 11, 2002  
TDH/cmp

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**In the specification:**

Page 1, between the title of the invention and the heading "FIELD OF THE INVENTION", please insert the following paragraph:

**RELATED APPLICATIONS**

The present application is a divisional of prior co-pending patent application serial number 09/187,311 filed on November 4, 1998, now U.S. Patent No. 6,192,585 issued on February 27, 2001.

Replace the paragraphs starting on page 12, line 1 through page 13, line 20 with the following:

Referring now to Figures 18 and 19, the preferred embodiment of the present invention includes a ball nut and method for producing a ball nut 10 having at least one internal bearing race with a first end and a second end. At least one recirculating crossover passage 18 connects the first end with the second end of the helical groove portion 16 to form a continuous recirculating path 12 for a plurality of ball bearings 14. The method according to the preferred embodiment of the present invention includes forming an eyelet 40 with a helix passage 42 for receiving a plurality of ball bearings 44 in a flange end 46. A crossover passage 48 is defined in the flange end 46, such that the crossover passage 48 is in communication with the helix passage 42 for returning the plurality of ball bearings 44 from one end of the helix passage 42 to an opposite end of the helix passage 42. [To] Two eyelets 40 are assembled in flange-to-flange relationship with respect to one another to define at least one raceway having a single recirculating rotational path 50 for receiving the plurality of ball bearings 44. The method according to the present invention can also include the step of over molding the assembled eyelets 40 to provide a unitary ball nut. Preferably, the eyelets 40 in the assembling step are identical to one another. The forming step can include the steps of drawing an eyelet 40, and coining the helix passage 42 and the crossover passage 48 in the flange 46 of the eyelet 40. The assembling step can also include the step of temporarily holding the two eyelets 40

with respect to one another with a lock member 52. The forming step can define at least one tab 54 on the flange end 46 of the eyelet 40 to define the lock member 52. The assembling step can include inserting the plurality of ball bearings 44 within the helix passage 42 and the crossover passage 48 during the assembling step. A punch [(not shown)] or diverter 56 in the helix passage 42 can be provided to direct ball bearings 44 into the crossover passage 48. Preferably, the eyelet is formed of a metal material selected from the group including steel, hardened steel, melonited steel, heat treated steel, stainless steel, spherodized stainless steel, annealed stainless steel and the heat treated stainless steel. Preferably, the eyelet is hardened to approximately 62  $R_c$  after the forming process.

According to the preferred embodiment of the present invention, a drawn eyelet 40 is formed with a helix passage 42 in the flange end 46, and a crossover passage 48 is defined to provide a ball return to the helix passage 42. The drawn and coined eyelet 40 is designed to fit exactly with a duplicate drawn and coined eyelet 40 to trap the balls 44 between the two when positioned in flange-to-flange relationship with respect to one another. A temporary holding lock 52 can be provided to hold the eyelets 40 together during transfer to a molding machine. The assembled eyelets 40 are overmolded, to provide a solidly configured ball nut. Preferably, the eyelet 40 is manufactured from steel, such as UNS 610090, hardened to approximately 55  $R_c$  to approximately 65  $R_c$  and preferably to approximately 62  $R_c$  and iron nitride hardened, or stainless steel, such as UNS 54000, spherodized, annealed and heat treated. The lock 52 can include one or more tabs 54 placed on the flange end 46 to temporarily hold the assembly together. A punch [(not shown)] or diverter 56 may be provided to direct the balls 44 into the crossover passage 48.

In the claims:

8. (Amended) The ball nut of claim 1 further comprising:

a [punch in] diverter extending with respect to the helix passage to direct ball bearings into the crossover passage.

38. (Amended) In a ball nut having at least one internal bearing race with a first end and a second end, and a crossover passage for connecting the first end and the second end to form a continuous recirculating path for a plurality of ball bearings, the improvement comprising:

a ball nut body with at least one helix passage for receiving a plurality of ball bearings, a crossover passage formed to define an individual raceway for each helix passage, each raceway having a separate, single orbit, recirculating rotational path, the ball nut body having an elongate, generally cylindrical-shaped, metal injection molded body.

Claim 39 is cancelled without prejudice.